CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

TUBERCULOSIS INFORMATION

Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Facilities, 1994

POSSIBLE QUESTIONS AND ANSWERS

1. What do the 1994 TB guidelines recommend?

In response to input that infection control policies should be based, in part, on the level of risk in the local facility, the revised guidelines direct health-care facilities to conduct a TB risk assessment. This risk assessment will allow health-care facilities to implement TB control programs appropriate to their level of risk of TB transmission and will provide for greater flexibility in adapting the recommended controls to a wide variety of health-care facilities, including those in which few or no TB patients are examined or admitted.

There are certain basic measures that all health-care facilities should implement to ensure that a program suitable to the needs of HCWs and patients is in place. There are five categories of risk in which control measures are implemented depending on the level of risk. The revisions recommend a hierarchy of controls to prevent TB transmission in health care settings including:

Administrative controls to reduce the risk for exposing uninfected persons to persons who have infectious TB. This includes developing and implementing effective written policies and protocols to ensure the rapid detection, isolation, diagnostic evaluation, and treatment of persons likely to have TB; effective work practices, education and screening of health-care workers.

Engineering controls to prevent the spread and reduce the concentration of infectious TB in a facility, including direct source control with local exhaust, controlling airflow direction, diluting and removing contaminated air by ventilation, and air cleaning with high-efficiency particulate air (HEPA) filters or ultraviolet germicidal irradiation.

The use of personal respiratory protection (i.e., NIOSH-approved respirators) in the few areas where exposure to TB may still occur when administrative and engineering controls are in place, such as TB isolation rooms, and areas where cough-inducing procedures are performed.

2. Why was a revision of the 1990 TB guidelines necessary?

The revisions to the guidelines are being made against a backdrop of outbreaks and transmission of tuberculosis in institutional settings. Between 1989 and 1992, CDC participated in investigations of outbreaks of MDR-TB in eight hospitals in the South and North East and a state correctional system. The outbreaks have been characterized by association with HIV infection, high case fatality rates (70-80 percent), a brief interval between TB diagnosis and death (4-16 weeks), and evidence of nosocomial transmission, i.e., transmission within the hospital setting. More than 100 HCWs in these hospitals have had skin test conversions following exposure to patients with MDR TB. At least 17 HCWs in these hospitals have developed active MDR-TB with 6 deaths, all of whom were immunocompromised.

Partially in response to these outbreaks, in April 1992, the Federal TB Task Force published the *National Action Plan To Combat Multidrug-Resistant Tuberculosis*. The plan called for the update and revision of the December 7, 1990, *Guidelines for Preventing the Transmission of Tuberculosis in Health-Care Settings, with Special Focus on HIV-Related Issues.*

In October 1992, a public meeting was held to discuss revision of the 1990 TB guidelines. Considerable input was received on various aspects of infection control including: health-care worker education; administrative controls in the early management of patients with tuberculosis; the need for more specific recommendations on ventilation and air cleaning; and the use of respiratory protection in health-care settings.

Although analysis of data from three of the facilities involved in the outbreaks indicates that transmission of TB greatly decreased or stopped entirely when the facilities were in full compliance with the 1990 guidelines, the guidelines were revised to add more details to help implement them, to incorporate what we have learned from the outbreak investigations, to incorporate the concept of worker education and training, and to incorporate suggestions made at the October, 1992 public meeting.

3. What kind of respirator is recommended?

The guidelines do not recommend a specific respirator but include the following standard performance criteria for respirators used in health-care settings for protection against *M. tuberculosis*.

1. The ability to filter particles 1 micron in size in the unloaded state with a filter efficiency of 95% or greater (i.e., filter leakage of 5% or less), given flow rates of up to 50 liters per minute.

2. The ability to be qualitatively or quantitatively fit tested in a reliable way to obtain a face seal leakage of 10% or greater.

3. The ability to fit the different facial sizes and characteristics of HCWs, which can usually be met by making the respirators available in at least three sizes.

4. The ability to be checked for facepiece fit, in accordance with OSHA standards and good industrial hygiene practice, by HCWs each time they put on the respirator.

NIOSH-approved high efficiency particulate respirators are the only currently available air-purifying respirators that meet or exceed the standard performance criteria stated above.

CDC/NIOSH is proceeding with a regulatory reform that proposes new certification standards for respiratory protective devices. The revised regulations will take advantage of new technology to provide better filtration at lower cost. Hospitals should then be able to acquire respirators which meet or exceed the 95% at 1 micron performance parameter at a cost substantially lower than that of the current disposable HEPA respirators.

4. When should respiratory protection be worn?

Personal respiratory protection is being recommended for use in selected health-care settings where administrative and engineering controls alone may not be sufficiently protective (e.g. TB isolation

rooms, and treatment rooms used for cough-inducing procedures). Respiratory protection is being recommended as the last line of defense where other controls are not likely to protect someone from inhaling infectious droplets (i.e., droplet nuclei).

5. How many health-care workers have been infected on the job?

In hospitals where CDC has participated in outbreak investigations between 1989 and 1992, more than 100 health-care workers (HCWs) have had skin test conversions following exposure to patients with multi drug resistant (MDR-TB), indicating recent infection with TB. At least 17 HCW in these hospitals have developed active MDR TB and 6 have died, all of whom were immunocompromised.

6. What does CDC have to say about the concerns of many health care practitioners that the respirators recommended are too expensive, uncomfortable, or not necessary?

Too expensive

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Uncomfortable

Some disposable HEPA-filtered respirators currently on the market have the look and feel of the dust-mist respirators and submicron laser masks which hospitals are already more familiar with. Further refinements by industry, particularly following institution of new certification standards will help alleviate concerns over discomfort.

Not necessary

Outbreaks among health-care workers in institutional settings have shown that strict adherence to TB infection control guidelines is needed to control infection. Follow-up investigations in three of the outbreak hospitals have demonstrated that implementation of the TB guidelines can interrupt transmission. Administrative and engineering controls and personal respiratory protection were associated with termination or significant reduction in patient-to-patient and patient-to-HCW multidrug-resistant and drug-sensitive *Mycobacterium tuberculosis*.

7. When will the new respirators be available?

The NIOSH final rule is expected in the first quarter of calendar year 1995. Since some manufacturers have indicated that some new respirator models for certification have already been developed, selected new respirators should be commercially available soon thereafter.

8. Is this not an example of government control of what should be a medical decision made by health-care facilities?

During the investigations of the MDR-TB outbreaks, incomplete implementation of the CDC 1990 TB guidelines was documented in all of the outbreak hospitals. These lapses in infection control practices contributed to the nosocomial transmission of *M. tuberculosis*. Subsequently, several surveys conducted in collaboration with the American Hospital Association, the Association of Professionals in Infection Control and Epidemiology, and the Society for Health Care Epidemiology of America have

documented that patients with MDR-TB are seen in nearly every state in the country and that many of our hospitals had inadequate TB programs, including inadequate isolation facilities for infectious patients and inadequate health-care worker TB skin testing programs. In addition, follow-up studies at several of the MDR-TB outbreak hospitals have documented that both patient-to-patient and patient-to-HCW TB transmission is terminated if infection control practices are fully implemented. Because of the serious morbidity and mortality of MDR-TB in both patients and HCWs, it is appropriate that the federal government intervene and ensure that patients and health care workers are protected from nosocomial transmission of *M. tuberculosis* in health-care facilities.

CDC develops recommendations based on the best scientific information available. Our goal is to prevent transmission of TB to patients and HCWs. The recommendations in the revised document are consistent with previous CDC recommendations. The recommendations were developed to provide as much flexibility as possible for each hospital to develop a TB control plan that will meet its individual needs.

In addition, federal law requires CDC/NIOSH and OSHA to establish mechanisms to protect the health of workers, including HCWs. CDC's role is to provide recommendations and guidelines on various scientific issues. In general, CDC is not involved in regulatory activities.

9. Do the guidelines take into account that every hospital does not have the same problems with TB?

The guidelines recommend development of a TB infection control plan based on a risk assessment. There are certain basic measures that all health-care facilities should implement to ensure that a program suitable to the needs of HCWs and patients is in place. There are five categories of risk in which control measures are implemented depending on the level of risk.

10. Why do health-care facilities have to do a risk assessment?

In response to input that infection control policies should be based, in part, on the level of risk in the local facility, the revised guidelines direct health-care facilities to conduct a TB risk assessment. This risk assessment will allow health-care facilities to implement TB control programs appropriate to their level of risk of TB transmission and will provide for greater flexibility in adapting the recommended controls to a wide variety of health-care facilities, including those in which few or no TB patients are examined or admitted.

Reprints of the 1994 guidelines will be available in mid-November. To order a copy, call (404) 639-1819 and leave a message.